



# STONE & WEBSTER MICHIGAN, INC.

P.O. Box 2325, BOSTON, MASSACHUSETTS 02107

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PRINCIPAL STAFF			
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United States Nuclear Regulatory Commission  
Midland Site Resident Office  
Route 7,  
Midland, Michigan

April 24, 1984

J.O. No. 14358  
Ref. MPF 83

Attention: Mr. Cook

DOCKET NO. 50-309/330  
MIDLAND PLANT UNITS 1 & 2  
INDEPENDENT ASSESSMENT OF UNDERPINNING  
REPORT NO. 83

A copy of the Independent Assessment of Underpinning Weekly Report No. 83 for the period of April 15, 1984 through April 21, 1984 is enclosed with this letter. Included as attachments are the minutes of the daily meetings held during the week between members of the Assessment Team and Site Engineering, Construction, and Quality Assurance personnel.

If you have any questions with respect to this report please contact me at (617) 589-2067.

*W. E. Keller for A. S. Lucks*

A. Stanley Lucks  
Project Manager

Enclosures  
ASL/pd

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Notes of Daily Meeting  
Independent Assessment of Underpinning  
Midland Plant, Units 1 & 2  
Consumers Power Company

Held at Midland Site  
Midland, Michigan  
April 19, 1984

Present For:

<u>Consumers Power</u>	<u>Bechtel</u>	<u>MPQAD</u>	<u>Stone &amp; Webster</u>
G. Murray	J. Fisher	J. McMaster	D. Benvie
R. Wheeler	J. Kelleher	J. Meisenheimer	D. Zito
	E. Cvikl		<u>Parsons Brinckerhoff</u>
			B. Metros

PURPOSE

This meeting is held each day to discuss items regarding the Independent Soils Assessment at the Midland Plant, Units 1 & 2.

DISCUSSION

Status Items

Item 83-19 - Auxiliary Building Underpinning Activities.

Installation of the reshore members is in progress for the drift to pier W5.

Routine rejackng has been completed for pier CT 1.

Excavation of the W17 pier shaft is complete.

Pier Kc9 was rejackng for load verification.

(INFORMATION ITEM)

New Items

Item 83-20 - Receipt Inspection of the CT 3/10 Transfer Frames and E/W5 Grillages.

J. McMaster reported that MPQAD will begin receipt inspection of the CT 3/10 transfer frames today. D. Benvie asked if receipt inspection of the E/W 5 grillages has been completed. J. Fisher will respond. (OPEN ITEM)

Item 83-21 - Weekly Report # 82.

The text of Weekly Report # 82 was reviewed. It was determined that all open items had been previously identified. (INFORMATION ITEM)

Response Items

Item 83-22 - NIR 24 Design Drawing Review at UAT Workprint Station.

D. Benvie stated that the Assessment Team has reviewed the QAR response to NIR 24 addressing document deficiencies at the UAT workprint station. Document deficiencies noted in the NIR have been corrected. Additionally, a sample audit of the UAT workprint station by MPQAD did not reveal any deficiencies. Based on the sample audit results and an independent review by the Assessment Team that the noted document deficiencies were corrected, NIR 24 is closed. (INFORMATION ITEM)

J.O. No. 14358  
Midland Plant  
Units 1 & 2  
Independent Assessment of Underpinning

Weekly Report No. 83

April 15, 1984 through April 21, 1984

Personnel on Site

Stone & Webster Michigan, Inc.

P. Majeski	4/15 - 4/17
D. Benvie	4/16 - 4/21
D. Zito	4/16 - 4/20
L. Rouen	4/16 - 4/20
J. Springer	4/17 - 4/19

Parsons Brinckerhoff Michigan, Inc.

J. Oliveira	4/15 - 4/18
B. Metros	4/18 - 4/21

Meetings Attended

<u>Date</u>	<u>Represented</u>	<u>Purpose</u>
4/16 - 4/20	Stone & Webster Bechtel Consumers Power Parsons	Daily Assessment Team Meeting

Underpinning and Remedial Soils - Construction

Pier E17: Excavation of the drift was completed.

Pier E5: Excavation of the pier shaft began. Drifting to the reactor containment for installation of the E5 grillage continued.

Kc4-Kc5 and Kc9-Kc8 Drifts: Excavation, lagging installation and backpacking continued.

Piers CT 3/10: Soils stabilization grouting and excavation of the drop pits for piers CT 2/11 continued in preparation for drifting to piers CT 3/10.

Piers CT 1/12: Routing rejackings has been completed for these piers.

Pier W5: Drifting to the reactor containment for installation of the W5 grillage was completed.

Pier W17: Excavation of the pier is in progress.

Access Shaft Level "C" Wales: Alignment and fitup of the level C wales continued for the east and west access shafts.

SWPS: Installation of the upper level wales continued. Grouting of the strut plates for support of the soldier pile wall has been completed along the east wall.

BWST: Construction of the ring foundation addition for both tanks has resumed.

Cathodic Protection: Installation of cathodic protection in the yard area has resumed.

J.O. No. 14358  
 Midland Plant  
 Units 1 & 2  
 Independent Assessment of Underpinning

#### Assessment Team Observations - Construction

Completion of load transfer for the CT 1 and 12 piers has allowed underpinning activities to progress into other areas of the Auxiliary Building. Excavation, backpacking, lagging placement and support steel erection for the drifts to piers Kc5/9 and E/W5 was observed by the Assessment Team. Lagging was installed one board at a time and backpacked prior to installation of the next board. The sand backpacking was tamped firmly and evenly into place. Drift support steel was aligned in accordance with design requirements. Drilling, installation and torquing of expansion anchors for the drift support sets conformed with project procedures. The level of workmanship exhibited in performing the activities associated with drift construction continues to result in a quality installation.

Other underpinning activities in the Auxiliary Building overviewed by the Assessment Team include soil stabilization grouting for the CT 3/10 drifts and excavation of the E5 and W17 pier shafts. The method of grout placement and grouting pressures used were in accordance with the procedures. Stability of the excavated CT 3/10 drift walls subsequent to grouting indicated that the grouting was effective. Excavation of the E5 and W17 pier shafts was performed with the aid of a template. Use of the template was effective in minimizing over excavation and maintaining the pier shaft alignments. The Assessment Team concludes that the implementation of the grouting program and use of the template was prudent and effective in stabilizing the soil and minimizing over-excavation.

#### Assessment Team Observations - QA/QC

The Assessment Team overviewed the MPQAD receipt inspection of the CT 3/10 transfer frames. The MPQAD inspector used proper inspection techniques to thoroughly verify all dimensional requirements with the applicable design and shop drawings. All material mark numbers were checked for traceability. The MPQAD findings included a fabrication error associated with a cross member of one of the transfer frames and a determination that some of the material mark numbers were missing. The Assessment Team concludes that the MPQAD receipt inspection of the CT 3/10 transfer frame was complete and thorough.

Crack mapping in the Control Tower by the crackmapping subcontractor (WJE) was witnessed by the Assessment Team. The activity was being performed by two technicians under the direction of a WJE Quality Assurance Engineer. The Assessment Team believes this approach is an effective method to ensure that both the procedural and technical intent of the project requirements for crack mapping are met.

#### Work Activity Packages

The following Work Activity Package (WAP) overviews are in the open response stage or have been completed during the past week.

<u>WAP No.</u>	<u>Title</u>	<u>Status</u>
		(Opened) (Closed)
83	Excavate, Install and Backfill Electric Ductbank and Equipment Pad For HVAC Fans	4/10/84 4/16/84

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 Midland Plant  
 Units 1 & 2  
 Independent Assessment of Underpinning

#### Nonconformance Identification Reports

The following Nonconformance Reports (NIRs) remain open or have been closed during the week.

<u>NIR No.</u>	<u>Description</u>	<u>Status</u> (Opened)(Closed)
22	Resident Engineering Document Control Stations	2/21/84
24	Design Drawing Review at UAT Workprint Station	3/30/84 4/19/84
25	Compressive Strength Testing of Concrete Cylinders	3/30/84

#### Open Items

Items discussed during meetings are categorized as follows:

OPEN ITEM - An item for which an action is required. The item will remain open until the required action has been taken. Tracking is required.

CLOSED ITEM - An item, usually brought forward by the Assessment Team that is discussed and adequately responded to. No tracking is required.

INFORMATION ITEM - An item brought forward to provide general background information regarding work, such as work status or an upcoming design change. No tracking is required.

OPINION ITEM - An opinion or suggestion given by the Assessment Team expressing an alternate construction or quality assurance technique. The opinion or suggestion is given as a possible alternate that may facilitate an operation.

CLOSES ITEM - XX-XX - This notation identifies an action that closes a previously identified open item. Tracking of the open item stops.

The following listing of all Open items from the Daily Meeting Notes with Bechtel and the text of the Weekly Reports. Carry-Over items from past weeks which have been Closed this week are also listed.

<u>Item No.</u>	<u>Description</u>	<u>Closure</u>
64-7	QAP Review Program	83-24
64-10	Trend Analysis	Open
71-17	Computerized Civil Drawing Register	Open

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 Units 1 & 2  
 Independent Assessment of Underpinning

<u>Item No.</u>	<u>Description</u>	<u>Closure</u>
74-21	US Testing Corrective Action	Open
79-26	Upper Leveling Plates	Open
79-28	SWPS Backpacking Material	Open
79-34	SWPS Backpacking Placement	Open
81-8	MPQAD Welding Audit	83-25
81-21	Pre Construction Verification of Soils Work	Open
81-25	Trend Analysis Work	82-9
82-3	Surface Voids in Grout	Open
82-9	Trend Analysis Update	Open
83-17	Crackmapping Subcontractor Audit	Open

WE Kilker  
 Project Engineer

WE Kilker for AS Seville  
 Project Manager



Notes of Daily Meeting  
Independent Assessment of Underpinning  
Midland Plant, Units 1 & 2  
Consumers Power Company

Held at Midland Site  
Midland, Michigan  
April 16, 1984

Present For:

Consumers Power

G. Murray

Bachtel

J. Fisher  
J. Kelleher  
E. Cvikl  
B. Brandes

MPQAD

J. McMaster  
R. Sevo

Stone & Webster

P. Majeski  
D. Benvie  
D. Zito  
L. Rouen

Parsons Brinckerhoff

J. Oliveira

PURPOSE

This meeting is held each day to discuss items regarding the Independent Soils Assessment at the Midland Plant, Units 1 & 2.

DISCUSSION

Status Items

Item 83-1 - Auxiliary Building Underpinning Activities.

Routing rejackng is in progress for piers CT 1/12.

Excavation of the drop pits to piers CT 2/11 has begun in preparation for drift excavation to piers CT 3/10.

Installation of lagging and backpacking has been completed for the pier W17 drift.

Excavation of the Kc4 to Kc5 and Kc9 to Kc8 drifts and installation of drift sets and associated lagging and backpacking is in progress.

Drifting to piers E/W5 has begun.

(INFORMATION ITEM)

Item 83-2 - SWPS Underpinning Activities.

J. Fisher reported that rain during the weekend had washed in a small portion of backpacking material along the north side of the SWPS. The affected area is presently being repacked. (INFORMATION ITEM)

Item 83-3 - US Testing Corrective Action.

J. Kelleher reported that all of the US Testing quality control procedures with attached work instructions have been submitted to project engineering for review. Final issuance of the quality control procedures is expected in the near future. (Item 74-21 remains OPEN)

Item 83-4 - Upper Leveling Plate.

J. Kelleher reported that smaller welds will be used to alleviate warping of the upper leveling plate that has resulted during welding of the leveling and bearing plate assembly. Project engineering will issue DCNs designating the

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Consumers Power Company

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new welding requirements for each type of leveling and bearing plate assembly. (Item 79-26 remains OPEN) (INFORMATION ITEM)

Item 83-5 - NIR 22 - Resident Engineering Document Control.

J. McMaster stated that the MPQAD audit of the Resident Engineers controlled documents required as part of the closure for NIR-22 has been completed. The audit verified that deficiencies with the Resident Engineers controlled documents noted in NIR22 have been corrected. Additionally, results of the audit indicate that the Resident Engineers controlled documents are being maintained properly. (NIR 22 remains OPEN) (INFORMATION ITEM)

Item 83-6 - NIR 25 - Compressive Strength Testing of Concrete Cylinders.

E. Cvikel stated that the QAR response written to address NIR 25 has been transmitted to MPQAD for review. NIR 25 was written as a result of deficiencies associated with the use of the maximum load indicator needle on the US Testing concrete compression machine. (NIR 25 remains OPEN) (INFORMATION ITEM)

New Items

Item 83-7 - Superplasticized Concrete.

P. Majeski asked if superplasticized concrete will be used for any future underpinning work. J. Fisher will respond. (OPEN ITEM)

Item 83-8 - NCR Processing.

P. Majeski asked if a review of the NCR process response time will be performed. MPQAD will respond. (OPEN ITEM)

Item 83-9 - Direct Hire Work.

J. Fisher reported that the following direct hire work activities will get underway in the near future:

- A. Boron Water Storage Tanks (BWSTs) ring foundations.
- B. Cathodic protection.
- C. Unit 2 HVAC foundation pad.
- D. Diesel Generator fuel oil lines.

(INFORMATION ITEM)

Response Items

No response items were addressed.



Notes of Daily Meeting  
Independent Assessment of Underpinning  
Midland Plant, Units 1 & 2  
Consumers Power Company

Held at Midland Site  
Midland, Michigan  
April 17, 1984

Present For:

Consumers Power

G. Murray

Bechtel

J. Fisher  
J. Kelleher  
E. Cvikl

MPQAD

R. Sevo

Stone & Webster

D. Benvie  
D. Zito  
L. Rouen  
J. Springer

Parsons Brinckerhoff

J. Oliveira

PURPOSE

This meeting is held each day to discuss items regarding the Independent Soils Assessment at the Midland Plant, Units 1 & 2.

DISCUSSION

Status Items

Item 83-10 - Auxiliary Building Underpinning Activities.

Soils stabilization grouting has begun for the drift to pier CT 10.

Excavation has begun for the W17 pier shaft.

Pier W9 was rejaacked for load verification.

(INFORMATION ITEM)

Item 83-11 - QAP Review Program.

R. Sevo stated that the QAP task force recommendations for improving selected PQCI's, construction procedures and specifications will be submitted to CP Co today. (Item 64-10 remains OPEN) (INFORMATION ITEM)

New Items

Item 83-12 - Pier E17 Drift.

D. Benvie discussed the drift to pier E17. It was noted that the drift, which is in full face concrete has progressed far enough to allow excavation of the E17 pier shaft. He questioned the need for completing the drift to the reactor wall, as the remainder of the drift is in fill concrete. J. Fisher will respond. (OPEN ITEM)

Response Item

Item 83-13 - Superplasticized Concrete.

In response to the Assessment Team question regarding future use of superplasticized concrete, J. Kelleher stated that it is not planned to

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Midland Plant, Units 1 & 2  
Consumers Power Company

Held at Midland Site  
Midland, Michigan  
April 17, 1984

use this type of concrete for future work. The original intent for the use of superplasticizer was to facilitate pier concrete placement and develop high early concrete strength in order to allow loading of piers within 2 to 3 days of concrete placement. For piers completed to date, no placement problems have been experienced with concrete that does not contain superplasticizer. Additionally, load transfer has normally not been performed until at least 7 days after completion of concrete placement, alleviating the need for high early strength of the concrete.  
(CLOSES ITEM 83-7)

Notes of Daily Meeting  
Independent Assessment of Underpinning  
Midland Plant, Units 1 & 2  
Consumers Power Company

Held at Midland Site  
Midland, Michigan  
April 18, 1984

Present For:

Consumers Power

G. Murray  
R. Wheeler  
J. Schaub

Bechtel

J. Fisher  
J. Kelleher  
E. Cvikl  
W. Brandes

MPQAD

J. McMaster

Stone & Webster

D. Benvie  
D. Zito  
L. Rouen  
J. Springer

Parsons Brinckerhoff

None

PURPOSE

This meeting is held each day to discuss items regarding the Independent Soils Assessment at the Midland Plant, Units 1 & 2.

DISCUSSION

Status Items

Item 83-14 - Auxiliary Building Underpinning Activities:

Soils stabilization grouting is in progress for the drift to pier CT 3.

Installation of lagging and backpacking is in progress for the drifts to piers E/W5.

Drift excavation to the containment for the E/W5 grillage is ongoing.

(INFORMATION ITEM)

Item 83-15 - NIR 24 Design Drawing Review at UAT Workprint Station.

J. McMaster provided the Assessment Team with a copy of the QAR response to NIR 24 addressing document deficiencies at the UAT workprint station for review. (NIR 24 remains OPEN) (INFORMATION ITEM)

Item 83-16 - Upper Leveling Plates.

J. Kelleher stated that a welding demonstration using smaller welds for the upper leveling and bearing plate assemblies will be given today. The purpose of the demonstration is to determine whether the smaller weld will decrease leveling plate warping. (Item 79-16 remains OPEN) (INFORMATION ITEM)

New Items

Notes of Daily Meeting  
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Midland Plant, Units 1 & 2  
Consumers Power Company

Held at Midland Site  
Midland, Michigan  
April 18, 1984

Item 83-17 - Crackmapping Subcontractor Audit.

E. Cvikel stated that the MPQAD audit of the crackmapping subcontractor (WJE) was completed yesterday. D. Benvie requested a copy of the audit report when it is issued. (OPEN ITEM)

Response Item

Item 83-18 - Pier E17 Drift.

J. Fisher responded to the Assessment Team question concerning completion of the pier E17 drift. Presently the drift which is in full face concrete, does not have to be advanced any further to allow construction of the E17 pier. However, procedural changes required to terminate the drift at this point would delay work on the E17 pier. The drift will, therefore, be completed to design limits. (CLOSES ITEM 83-12)

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Midland, Michigan  
April 19, 1984

Item 83-23 - NCR Processing.

J. Meisenheimer responded to the Assessment Teams question concerning NCR process response time. It was stated that with minor exceptions, the process time associated with recent NCRs has not adversely impacted construction progress. MPQAD believes that timely processing of future NCRs can be maintained as the construction activity and complexity increases. The Assessment Team concurs with this response. However, D. Benvie stated that as part of the Assessment Team's normal overview of the work, the NCR resolution process will continue to be evaluated. (CLOSES ITEM 83-8)

Item 83-24 - QAP Review Program.

The Assessment Team reviewed the QAP task force recommendations for improving selected PQCI's, construction procedures and specifications that were submitted to CP Co. The recommendations include revisions to these documents to facilitate construction and inspection of structure steel fabrication and erection, expansion anchor installation and welding. The recommendations also include guidelines for use in developing PQCI's, construction procedures and specifications associated with new construction areas or revisions to existing construction areas. The Assessment Team believes that the efforts of the QAP Task Force were thorough. The recommendations developed by the Task Force will be useful in streamlining and facilitating inspection and construction for the processes reviewed. The Assessment Team also believes that the guidelines recommended for developing PQCI's and procedure for new construction areas will enhance the respective inspection and construction processes. This item is closed. (CLOSES ITEM 64-7)

Item 83-25 - MPQAD Welding Audit.

J. McMaster provided the Assessment Team with a copy of the MPQAD Welding audit report. (CLOSES ITEM 81-8)

Notes of Daily Meeting  
Independent Assessment of Underpinning  
Midland Plant, Units 1 & 2  
Consumers Power Company

Held at Midland Site  
Midland, Michigan  
April 20, 1984

Present For:

<u>Consumers Power</u>	<u>Bechtel</u>	<u>MPQAD</u>	<u>Stone &amp; Webster</u>
R. Wieland	J. Fisher	J. Moran	D. Benvie
	J. Kelleher		D. Zito
	E. Cvikl		
			<u>Parsons Brinckerhoff</u>
			B. Metros

PURPOSE

This meeting is held each day to discuss items regarding the Independent Soils Assessment at the Midland Plant, Units 1 & 2.

DISCUSSION

Status Items

Item 83-26 - Auxiliary Building Underpinning Activities.

Excavation of the E5 pier shaft has begun.

All major structural sections have been set into place for the Level C wales in the east access shaft.

Piers E9/10 were rejaacked for load verification.

(INFORMATION ITEM)

Item 83-27 - SWPS Underpinning Activities.

J. Fisher stated that welding of wale gusset plates and shims for the soldier pile wall along the east side of the SWPS was in progress. Full penetration welds are required for the gusset plates and shims. This requirement has delayed further excavation below the first level wales on the east side of the SWPS until later next week. (INFORMATION ITEM)

Item 83-28 - Direct Hire Work.

J. Fisher reported that direct hire work on the BWST ring foundations and cathodic protection has begun. Work in the Unit 2 HVAC foundation pad will commence once the work package has been approved by CP Co. (INFORMATION ITEM)

New Items

No new items were discussed.

Response Item



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Midland, Michigan  
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Item 83-29 - Receipt Inspection of E/W5 Grillages.

In response to the Assessment Teams question regarding receipt inspection of the E/W5 grillages, J. Fisher stated that receipt inspection has not been performed. However, the established schedule for inspection of the grillages does provide for timely inspection of the grillages prior to the scheduled installation. (CLOSES ITEM 83-20)